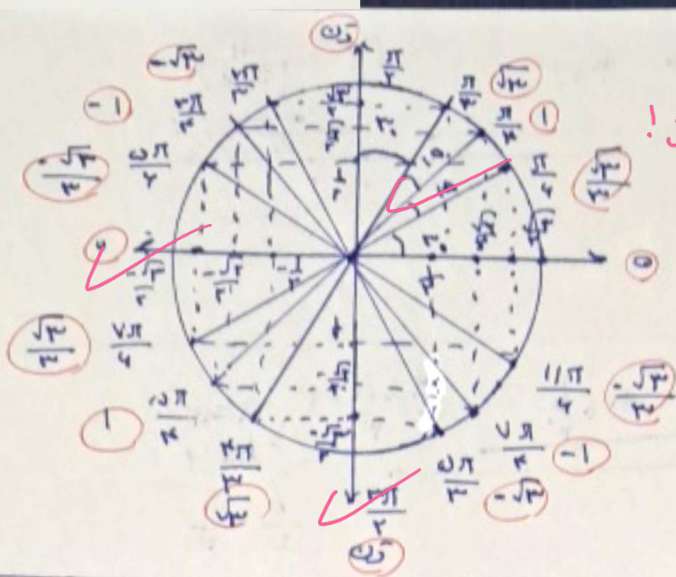




۲. آزمون عالی نوشته!

تکلیف ۲. تعیین اصل و نامبر و ...

$$\sin \frac{\pi}{4} + \cos \pi + \tan \frac{5\pi}{4} = \frac{1}{2} + (-1) + 1(-1) = -\frac{1}{2}$$

$$-\cos \frac{\pi}{4} + \sin \frac{4\pi}{3} - 2 \sin \frac{5\pi}{4} = -\left(-\frac{\sqrt{3}}{2}\right) + \left(\frac{1}{2}\right) - 2\left(-\frac{\sqrt{3}}{2}\right) = \frac{\sqrt{3}}{2}$$

$$\cot \frac{\pi}{4} + 2 \cot \frac{4\pi}{3} - 2 \tan \frac{5\pi}{4} = -\frac{\sqrt{3}}{2} + 2\left(\frac{\sqrt{3}}{2}\right) - 2\left(-\frac{\sqrt{3}}{2}\right) = \frac{\sqrt{3}}{2}$$

$$\cos(\sin \pi) + \sin(\pi \cos \frac{\pi}{4}) = 1 + \sin \frac{\pi}{4} = 2$$

$$ar + ra = ra + ar \rightarrow ar + a - r = r \rightarrow a = 1$$

$$f(1) = 1$$

$$f(n) = \begin{cases} n^2 + r_n & n \geq 1 \\ (r_{n+1} + r_n) & n \leq 1 \end{cases}$$

$$r_n r - b \rightarrow a \leq -r \rightarrow n \geq 1 \Rightarrow 1 - b = a + (-r) \Rightarrow a + b = r$$

$$f(n) = \begin{cases} r_n r - b & |n| \geq r \\ a + r_n & -r \leq n \leq -1 \end{cases}$$

$$f(n) = n^3 - r n^2 \neq 0 \Rightarrow n^2(n - r) \quad D_f = \mathbb{R} - \{0, r\}$$

$$b) = \frac{1}{r_n^3 + r_n^2 + r_n + r} \Rightarrow (r(-1) + f(r) - r + r) = r_n^3 + r_n^2 + r_n + r = (n+r)(r_n^2 + r_n + r)$$

الف) $x^2 - 1 \geq 0 \implies x \geq 1 \text{ or } x \leq -1$ $\textcircled{1}$ $x - 2 \geq 0 \implies x \geq 2$ $Df = [2, \infty)$

ب) $4 - 3x \geq 0 \implies x \leq \frac{4}{3}$
 $4x - 3 \geq 0 \implies x \geq \frac{3}{4}$ $Df = [\frac{3}{4}, \frac{4}{3}]$ $\textcircled{2}$

$4x - a \geq 0 \implies \frac{a}{4} \leq x$ $b - 3x \geq 0 \implies x \leq \frac{b}{3}$ $\frac{a}{4} = \frac{b}{3} = 2 \implies a = 8, b = 6$
 $\frac{a}{4} = \frac{b}{3} \implies \frac{b}{a} = \frac{3}{4}$ $\textcircled{3}$

الف) $x^2 - 4 = (x-2)(x+2)$ $-2, 2$

ب) $x^2 - 4 = (x-2)(x+2)$ $\pm 2, \pm 2$

$P(x)$ $\begin{array}{c|cccc} & -2 & -2 & 2 & 2 \\ \hline & + & - & - & + \end{array}$

$Df = (-\infty, 2) \cup (2, \infty) - \{2\}$

الف) $x^2 - 4 = (x-2)(x+2)$ $-2, 2$

ب) $x^2 - 4 = (x-2)(x+2)$ $\pm 2, \pm 2$ $a = -1$ $(x-1)(x-2)(x+2)$

$Df = (-\infty, 2) \cup [2, -1) \cup [1, 2) \cup [2, \infty)$

الف) $[x] \geq 2 \implies x \in [2, 3) \implies Df = [2, \infty)$ $\textcircled{4}$

ب) $2[x] - 4 \geq 0 \implies [x] \geq 2 \implies [x] \geq 2 \implies Df = [2, \infty)$

الف) $\frac{x+1}{|x-3|} \geq 0$ $x = -1$ $P(x)$ $\begin{array}{c|cc} & -1 & 3 \\ \hline & - & + \end{array}$ $x = 4$ $\frac{4-x}{x^2+x+3} \geq 0$ $P(x)$ $\begin{array}{c|c} & 4 \\ \hline & + \end{array}$ $Df = [-1, 4] + \{3\}$ $\textcircled{5}$

ب) $[x] - 2 \geq 0 \implies [x] \geq 2 \implies x \in [2, \infty)$

$2[x] \geq 0 \implies [x] \leq 0 \implies x \in (-\infty, 1)$

$Df = \emptyset$ $\textcircled{6}$